

LEDERBERG, J., University of Wisconsin, Madison, Wis.--Phase variation in Salmonella.--The flagella carried by cells of a given serotype occur in two alternative phases (specific/group or 1 and 2) which are genetically conservative. The alternation may occur at a rate of 10^{-4} per generation (B. Stocker) or often much less, and superficially resembles point mutation. Genetic transduction analysis (Lederberg and Edwards, *J. Immunol.* 71, 232) has shown, however, that the alternative specificities are controlled by two distinct loci, H_1 and H_2 , corresponding to the two homologous series of antigens, and accounting for the oscillation between just two states. The mechanism of genetic differentiation of the phases has not been settled: it might depend on the cytoplasm (as in *Paramecium*) or on the state of a third locus. However, the correlation found between the antigenic state of the donor cells and the transductive competence of phage lysates from them suggests a third alternative: that the differentiation is based on the states of the H_1 and H_2 loci themselves.-- In addition, certain other antigenic variations, so-called "artificial phases" have been found to behave not as phasic oscillations but as point mutations of serological specificity, e.g. H_1^b to H_1^{z33} .

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